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ELECTRO-THERAPY

WITH THE

MORSE WAVE GENERATOR

*SECOND EDITION*

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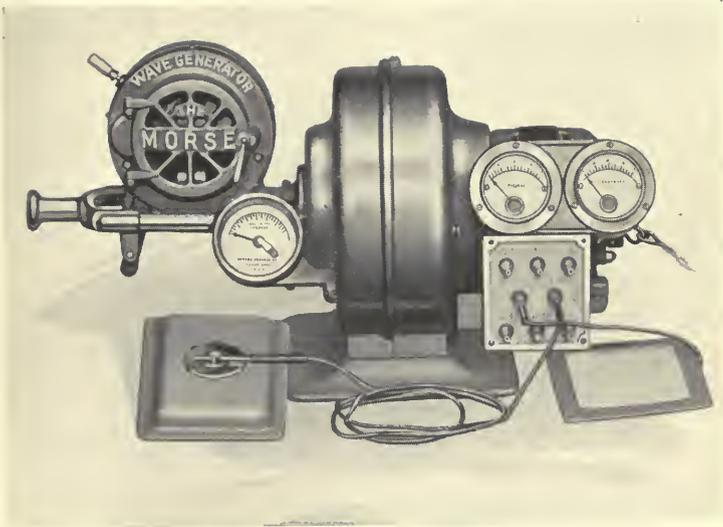
**ELECTRO-THERAPY**  
WITH THE  
**MORSE WAVE GENERATOR**

BY

**FREDERICK H. MORSE, M. D.**

(University of City of New York, 1881)

President of the American Electro-Therapeutic Association in 1900, President of The New England Electro-Therapeutic Association 1906-1907, Instructor on Electro-Therapeutics at Tufts College Medical School, 1907-1908, U. S. Delegate to International Congress of Physio-Therapy at Rome 1907 and Paris 1910.



THE MORSE WAVE GENERATOR

## FOREWORD

In the following pages the writer will attempt to give, necessarily briefly and dogmatically, sufficient information for the intelligent use of the alternating and continuous, or galvanic current, in disease. This book is intended for those, who have neither time nor inclination to study larger works on the subject.

The instruction given in the following pages are for the guidance of those who are unfamiliar with the technique of wave-current therapy and the many phases in the use of the galvanic current, and who further have had no didactic or positive instruction in the use of the application of electricity in treatment of disease, and are apt to hesitate as to methods and dosage, and their adaption to each individual case. The physician who has become an apt technician will have no need of reiteration of the basic principles of the subject, and will use such original methods and modifications as personal experience or tact may devise.

With a new Therapeutic Method having distinct and prominent advantages, an explanation of principal and technique of application, is essential.

## PREFACE

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The purpose of this book is two-fold. First, to outline briefly as possible well-known facts and accepted theories of the physical and chemical action, on human tissue, of electrical and mechanical therapeutic methods. Second, to establish a systematic basis for application which, being scientific and rational, must meet the commendation of the profession. I hope to make the instructions sufficiently clear, that the method of relieving Stasis and restoring function will be better understood.

My object is to impress upon the busy practitioner of medicine, perhaps more than upon the Specialist, the importance of caring for the human body, in health and disease, as a kind of mechanism, rather than a complicated mass of protoplasm, in which every perversion of normal function must be met with drugs, or other symptomatic treatment. In addition the author's principle purpose is to impress on the profession the importance of imitating Nature, as nearly as possible, in restoring normal cell activity, by definite physical therapeutics, rather than by the use of Sedatives, Cathartics, etc.

It seems to the general practitioner of medicine, who has been dependent wholly upon his pharmaceutical allies, and with whose methods he has been satisfied, to be illogical and presumptuous, to step aside from the beaten path and to use methods which he has heretofore considered irregular, and used only as weapons of a Charlatan, for making money.

To a physician attempting to obtain definite therapeutic results through rhythmic mechanical or electrical measures, it would seem a radical change from his former dependencies, drugs and surgical instruments. Any physician who will familiarize himself with modern teaching of natural and physiological measures, in his effort to restrain abnormal vital action, has made a great stride in his efficiency as a medical man.

It is not the purpose of this book — which is intended only as a therapeutic guide — to write history, theorize, or express private opinion, but only to aid the profession in becoming better acquainted with the laws of electro-physics and the physiology pertaining to the subject.

For more than two hundred years the use of electricity, and physical therapeutics generally, has passed through many vicissitudes. As each fresh important discovery in the science

has been reached, much interest has been aroused anew in the subject, and its therapeutic properties and wonderful possibilities have been extended throughout the medical world. These discoveries, with extravagant promises of cure, were followed by some successes but by more failures and disappointments, causing them to be discarded, and after a time revived brought to public attention as some new modality.

The following pages are not intended as a guide covering the whole field of physical and electrical therapeutics, for those and other modalities of intrinsic value are in a distinct class by themselves, each of which would require a volume to properly present the subject.

The alternating current, except for high frequency and its still more valuable congener, the X-Ray, has been used only commercially.

The advent of the Morse Wave Generator upon the field of therapeutic action has, to a certain extent, along with manifold features of the direct current, with its variations of voltage and amperage, revolutionized physical and electrical treatment of disease.

That there may be no misinterpretation of the theoretical and practical consideration herein set forth, it may be well to advise the reader of the importance of recognizing the significance of amperage and voltage. As applied in therapeutics, high amperage means chemical action; high voltage, penetration. Upon proper adjustment of these essentials depends the result of electrical application.

## DIRECT CURRENT

It is regrettable and to a certain extent lamentable that the many thousand users of electricity in medicine — who have a fairly good conception of the use of vibration, spinal manipulation,— and the significance of spinal nerve supply to the various viscera, and a general idea of the application of high-frequency and static currents — are woefully deficient of even elementary knowledge of the galvanic current. This is not because they are not willing and anxious to obtain such information, but because modern text books on the subject are wanting, and instrument dealers have not exerted themselves in that direction, therefore, little has been written on the well-known physical laws of the constant current.

It is an established fact that the current passes from the

positive to the negative pole, and it influences the fluids of the body in the direction of the current. The physiological action of this current passing through living tissue is to elevate the temperature of the section through which it passes. Where a metal contact is made upon the skin of healthy living tissue, a burning sensation takes place at either pole, but it is much more distinct and irritating at the negative, or exit of the current. If a sufficiently strong current be used when two metal pointed electrodes are applied to a portion of the body, at the positive pole there will be a contraction of the skin at the point of contact, and if sufficient amount of current be used, a burn will take place, which will leave a scar, hard and dry in character and more or less bleached, caused by diminished blood supply. At the negative pole, with the same strength of current, the parts will become red and congested, due to the increased blood supply, and if the current be made sufficiently strong, a burn will ensue, as at the positive pole, but totally different in character, which would be soft, spongy and yielding, leaving a scar difficult to heal.

At the positive pole is an increasing accumulation of oxygen and acids. At the negative, alkalis and hydrogen. It is absolutely essential, for one using the galvanic current, to be familiar with the above described chemical action, that mistakes may not occur. Having obtained the knowledge of just what can be done chemically and physiologically and using neither too much temerity nor undue timidity, the physician has at hand a two edged weapon which gives a wider range of usefulness as far as local applications are concerned in the treatment of disease, than all other methods combined.

From the processes resulting from the action of the direct current, in its passage through animal tissues, we have in electrotherapeutics the names Electrolysis and Phoresis, (anaphoresis and cataphoresis). We are perhaps, too much accustomed to think of both these phenomena, chemical decomposition and mechanical transference of electrons, (electrolysis and Phoresis) as terminal effects of the current; that is, as taking place only in those tissues in the immediate vicinity of the electrodes.

It is true, that by reason of concentration or destiny of the current at the points where the electrodes are applied, the effect there is greatest; but it must be understood that the same action, only in less degree, is occurring all along the path through the tissues over which the current travels.

Muscular fibre deprived of its nerve supply fails to react under any Faradic stimulation. It reacts only to galvanic stimulation, and the progressive decrease in galvano-muscular irritability indicates accurately the stage of muscular degeneration. In paralysis, a disease of the motor cells of the cord, we find at first, though only for a brief period, a distinct increase of irritability. From the fact that this increase of irritability develops slowly, it is evident that it is due to a progressive degeneration of the nerve endings rather than loss of nerve impulses. If the muscular fibres preserve their transverse striation, as indicated by their reaction to galvanic stimulation, there is hope of ultimate recovery, or at least of improvement; but when their reaction progressively grows less and is finally lost, the transverse striation has been replaced by granular and fatty degeneration, and no treatment can hope to be of service.

In examining the muscles of children, it is of the utmost importance to eliminate, as far as possible, all pain and even discomfort. We should make our examinations as agreeable as possible, for the best interests of the patient.

The rapid interruptions, which make up what is termed alternating and Faradic currents, do not affect the muscular fibre, but only the more sensitive nerve structure. They give no time for a distinct muscular contraction which becomes tonic rather than clonic.

Definite or measurable therapeutics, by means of applications of electricity of physical measures to the human body, is rarely attempted or accomplished except by the use of the direct, or commonly called, Galvanic current. A current of electricity flowing from the positive to the negative pole causes well-known chemical and physiological action, not only within the medium, which is in the circuit, but at the entrance and exit of the current. These absolute and certain actions on live tissues are neither theories nor opinions of the author, but facts. With a knowledge of the true significance of the terms, Amperage, Voltage, and Resistance, one can do definite therapeutic work, as in no other way.

A given amount of current using a large voltage (175 to 200) would produce a deeper action with much less or almost no skin disturbance, when surface electrodes are used.

This variation of current penetration is all important in the use of the galvanic current when the ailment is far from the surface, and the usual galvanic applications are too often prohibited

because of the burning (skin resistance) sensation. The therapeutics of this is described further on.

Physicians have, to a certain extent, become familiar with the medical value of Sine Wave apparatus, Faradic and Static currents, but a distinct measured wave on the alternating current and a measured wave uni-directional direct current are entirely new applications.

The fact that a uni-directional measured wave surging current can be used, selecting the desired Cam for the muscle impulse required, gives a decided advantage over the well-known sinusoidal current, reversing the polarity of a direct current. In the former case a normal action may be maintained and in the latter, exhaustion and fatigue are apt to follow.

Many attempts have been made to imitate the physiological muscle action by mechanical application of electrodes, the impulses being timed by the watch to a certain number of them per minute. But never before has a mechanical automatic form of apparatus been placed before the profession that can be depended upon to do precisely, as far as physiological action is desired, what is demanded of it.

The majority of functional disturbances are overcome without help from any source, especially in young people, but when Nature fails to eliminate in a reasonable time the cause of the affliction, whether it is retained intestinal toxemia, or naso-pharyngeal infection, in nerve or joint tissue, something definite and local must be done at once, or a chronic, infiltration, thickening, or some unpleasant pathology, hard to eliminate, will follow.

Instead of describing and illustrating every disease or condition in connection with which the Generator may be used with benefit, the author has endeavored to convince the reader of the importance of knowing what the apparatus will do mechanically, and also of knowing the essentials of the action of the direct current together with the demonstrations, so that even a novice in electro-therapeutics can work intelligently.

Since no two conditions requiring treatment present exactly the same phases, sound judgment and common sense must necessarily be used, as in any other branch of medicine, after the fundamental principles are understood.

The use of the Faradic Current, once so properly and universally used, the mechanical vibrator, and many other forms of mechanical gymnastic exercises of the Zander type, have fallen into disuse. No doubt they had their points of excellence over

other methods in their times, but the world moves and science and invention with it.

The static machine with its valuable qualities for elimination of non-purulent infection, and its wide range of therapeutic indications is being used less and less, because the adoption of the high-frequency and other modern forms of electrical apparatus to a large extent, takes its place. Not since the discovery of the galvanometer, an instrument for measuring the galvanic current, so that an accurate dosage is made attainable, has anything been placed before the medical profession like the Morse Wave Generator, which has so brought the alternating current under control, that definite measured applications are in keeping with physiological teaching.

Dr. William Benham Snow of New York has written many excellent and comprehensive books on the indications for the use of physical and electrical modalities, which the reader will do well to read. His writings are full of valuable suggestions along this line as shown by the following quotations:—

1st. "Chronicity with degeneration and structural change, which must be taken into consideration in determining the prognosis in every case, is the bete-noir of therapeutics."

"The laws which govern the action of the great number of modalities, electrical, thermal, mechanical, nutritional and actinic, are capable of a scientific and definite determination along rational lines. The consideration of these questions from an empirical point of view is no longer deserving of the attention of scientific minds, for positive physical agents give uniformly positive therapeutic results when similarly applied in like cases, indicating the possibility of establishing definite laws of action and indication."

"Disease arises from, or is associated in almost all cases, with an inflammatory process, infected or non-infected. Inflammatory processes present characteristic conditions varying slightly according to the character of the cause."

2nd. "Functional torpor presents conditions of relaxation and softening of tissue, with weakening of the muscular force and general loss of circulatory and nervous tone arising usually from the atony of inactivity or paralysis of the part effected."

3rd. "Degenerating conditions of the different structures call for altered activities to stop the process."

4th. "Conditions secondary to other processes usually of inflammatory origin with impaired secretion and other inactive functions."

5th. "Contractures or conditions of muscular spasm are associated usually with an impairment of the nerve centres, of the nerve trunk, or with inflammatory process in the joints involving the skeletal as well as other muscles of the body. The indications in all cases demand first the relief of the process of congestion or other irritation and coincidentally treatment of the spasmodic condition present."

The Morse Wave Generator was designed for the special purpose of carrying out definite muscle and nerve action, which, as we physicians thoroughly understand, is so all important in restoring normal cell activity. The arms as used in rowing a boat from twenty-two to twenty-four strokes a minute, with an equal period of contraction and relaxation, illustrates the above theory of normal physiological action; likewise one walking at an ordinary gait, of about seventy steps a minute, the movement of all the muscles involved in the act of respiration, eighteen to twenty-two times a minute, and the peristaltic action of the stomach and colon, about eleven times a minute, give a fair illustration of well-known conditions as they actually occur.

To synchronize the above named muscles which principal can be applied all over the body in a form of mechanism that is automatic and painless, is an achievement that has unquestionably advanced physical therapeutics more than any other thing in this generation.

To be proficient in the use of any form of apparatus in medical practice, one must necessarily become familiar with the technique of application. Also one should recognize the indications for exercise and massage as may apply to the use of the alternating current. If the description of the physiological and chemical action, with brief directions for applications of the galvanic current is not thoroughly understood, then additional information should be sought from text books on the subject.

**Muscle Action**—That the muscles of the body are the immediate source of energy by which its own parts are moved at will, as well as other things, is so obvious that it is not necessary to elaborate along that line. About seventy-five pairs of the two hundred muscles in the body are used to maintain the general posture and movements of the body. Others are of

special shape, size and length to meet the various indications of the local area of work intended for their special use. When any muscle, or set of muscles, fails to respond to the nerve impulses, which is its guide for action, it is because of some faulty function of the nerve itself, or impairment in the muscle involved.

That the whole digestive tract is a series of hollow muscular fibres, varying in strength and rapidity of action, is well understood. An impaired area of the aforesaid involuntary muscles not only cause local disturbance, but also throws out of balance contiguous or remote visceral structures, which causes functions dependent upon it to become disarranged.

Muscles that are used naturally have more tone than those less active, and whatever retards the normal process sooner or later must be overcome that the part may not become impaired.

An attempt to restore normal muscular vigor unless done with reference to the existing pathology is certainly working in the dark. We are instructed in our physiological teachings that certain well-known parts of the body have definite muscular action; if through injury or disease muscular ability is impaired and an attempt is made to restore function by any electrical or physical means, and the process thus instituted be much more rapid than is normal for the individual part, then fatigue and exhaustion may follow. If on the other hand, the process to regain lost ability be much slower than normal, metabolism fails to assert itself.

Many forms of mechanical apparatus have been devised in this country and Europe, especially Sweden, to attempt to synchronize normal muscle impulse, and to a certain extent have succeeded. The apparatus, however, has usually been cumbersome, and, so far as the author has been able to ascertain, is devoid of the essential to make it a success, namely, localization of application, so that deep or superficial invigoration may be obtained in measured form.

## ALTERNATING CURRENT

Alternating currents of electricity as distributed from the street lighting circuit, while available for lighting and power, cannot be used for therapeutical purposes. The process of reducing, by means of transformers, make it practical for the physician's use.

It is a principle of well-known physical laws that penetration, through liquid or solid bodies, by heat, light, sound and

electricity, depends upon their wave lengths. The shorter the wave lengths, the deeper the penetration, and the principle applies in therapeutics by application on the human body of electricity, vibration, X-Ray, etc., with the single exception of the direct current.

The transformer is, in principle, identical with the physician's induction coil, commonly called Faradic, consisting of a primary and secondary coil wound over an iron core. The current in the primary induces distinct and second current impulses in the secondary coils. In the ordinary induction coil the low-pressure large-amperage current in the primary, induces a high-pressure small-amperage current in the secondary. In the reducing transformer the high-pressure small-amperage current in the primary induces a low-pressure large-amperage current in the secondary. When this process of transforming is carried on sufficiently so that voltage and amperage be reduced to the point of safety for medical purposes, then the foundation for a therapeutic practice is established.

When one or two coils of wire constituted as described for commercial purposes with its primary and secondary arrangement is made to revolve or pass to and fro in close proximity to the terminals of an electric magnet, there is set up in that coil a secondary induction, which, when connected with the proper wire terminals, so that it may be applied to the human body, produces an effect, which is strictly speaking an alternating current. The more rapidly it is revolved or passed to and fro near the magnet, the shorter the alternations are in the current that is produced, the pleasanter the sensation and deeper the penetration in effect. When two coils and two magnets are arranged in the same manner and the same process instituted, other things being equal, the lines of force will be cut in half, or, in other words, be half as long in alternations. Six permanent magnets and twelve coils, like the above described, charged with a direct current of electricity, one remaining stationary, the other revolving in close proximity, will set up exactly the same kind of induction, as above described, only the lines of magnetic force will be cut six times twelve or seventy-two times faster, as compared with one coil and one magnet, and with this increased rapidity of alternations the skin is less disturbed.

To carry this principle still further, the twelve coils of the Morse Wave Generator opposing twelve powerful, permanent, steel magnets, the armature revolving at a high rate of speed still further accentuates the principle. The enormous rapidity

of the alternation thus produced makes the identity of the usual sine wave impulse destroyed and thus a fine thrilling sensation is produced. The introduction of the cam principle in the circuit establishes a new definite and measured physical and electrical addition to the physicians armamentarium which will be appreciated more and more as familiarity with its efficiency is understood.

A current which periodically flows in the opposite direction and in both directions for the same length of time, and whose variations in strength when flowing in either direction take place in the same manner are equal in amount. When the current has passed from zero to a maximum value in one direction, then again to zero and on to the same maximum value in the opposite direction, and again to zero, it is said to have completed a cycle. The number of cycles passed through in one second is termed the frequency of the current.

Fig. A

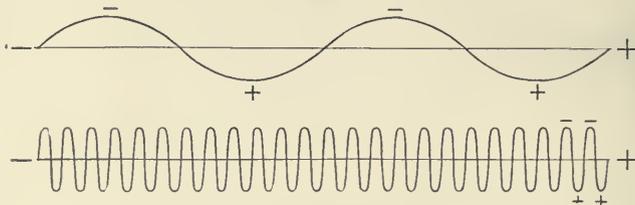


Fig. B

The above description is what is understood to be a true sine wave as in Figure A, while in Figure B the same sine wave principle is carried out, only many hundred times more rapidly, until the identity of the sine wave is lost and a thrilling sensation, instead of a distinct muscular impulse, is felt. Then, by the use of the various shaped discs, called Cams, the different actions as desired will be produced in a very pleasing manner.

As an illustration, the true sine wave, so-called, may be compared to looking through a slowly revolving wheel where the spokes can be plainly distinguished, and one revolving so rapidly that the spokes are not recognizable, a la sine wave of the Morse Wave Generator. The above simile may enable one to understand further the principle involved.

## INTERSTITIAL ELECTROLYSIS

Interstitial Electrolysis is a process whereby tissues may be dissolved by means of a metal contact with the negative pole.

Electrolysis is the decomposition of a chemical compound into its constituent parts by an electric current. If a galvanic current is made to pass through a liquid composed of different elements it is possible to set up a chemical action which results in a separating process of its ingredients. When the process is applied in a proper manner to living tissue a local destructive action is inaugurated at the point of contact of the negative pole and Interstitial Electrolysis takes place, the extent of which is in proportion to the length of time and strength of current used.

But for the general practitioner who is constantly annoyed by his inability to successfully treat his cases of Cervical Stenosis, Urethral Strictures, Oesophageal Stricture, Rectal Stricture, and the like, the technique consists of placing a positive surface electrode on the body and proper shaped negative electrode for the case at hand placed in position, and a current of three to five m. a. only, from D. C., R. I, not over three minutes in the Urethra, or five minutes in the Cervical Canal. Even less current is used for small growths.

It always must be, regardless of all instructions, the operator's knowledge and judgment, just when and to what extent the method is to be employed.

## METALLIC ELECTROLYSIS

Metallic Electrolysis is a process by which metals, when placed in contact with a moist surface, are oxidized by the positive pole. In therapeutics an inflamed Mucous Membrane is the usual seat of application. In other applications to Mucous Membranes, where the effect of the positive pole is desired, and not the special virtue of any particular metal, only carbon, gold or platinum can be used, as they are insoluble by the galvanic current. The price of gold and platinum being an objectionable feature and carbon being an equally good conductor, the latter is nearly always used.

In Metallic Electrolysis, copper or zinc-tipped electrodes are commonly used, but any soluble metal that may be adapted to the case, will serve the purpose.

The method of procedure consists in the placing of an electrode tipped with copper, zinc, or whatever metal may be

used, made in the various shapes and sizes to conform to the several cavities where used. As an illustration, for a Vaginal Catarrh, use a negative abdominal electrode, No. 1 Cam, D. C., R. I. and a current of about 10 m. a. for ten minutes, oxidation of the metal takes place forming an oxychlorid of copper at the point of contact. The current flowing from positive to negative pole causes the astringent, deposited on the inflamed surface, to be forced into the tissues sufficiently to cause a more curative action than would happen if a solution of copper or other metal were used. Care should be taken that not only the insertion may be made without undue pain, but that the removal of the electrode may not denude the Mucous Membrane. To prevent such an occurrence reverse the current. The negative pole will quickly release the adherent tissues about the electrode without having any contra-effect on results obtained.

In bleeding Hemorrhoids, Fig. 4, Erosion of the Crevix, Granular Conjunctivitis, and Pharyngitis, the application of zinc or copper-tipped electrodes by the metallic electrolysis method with proper technique, produces results much more rapidly than by the ordinary applications. Greater care must be observed as to arrangement of voltage and amperage in the more delicate areas.

The advantages of the method over the local application of sulphate of copper in stick or in solution, of zinc, in paste or solution, or of iron in solution are as follows:

First, the medicinal action of the metallic salt upon the diseased surface is more accurately localized. For instance, in the treatment of a deep sinus, a copper probe may be carried to the bottom and the copper salts deposited there where most needed; second, drugs introduced into the system in a nascent state are much more active than in chemical combination; third, by cataphoresis, the salts formed are driven into the tissues, rather than laid upon the surface of a mucous membrane, as in ordinary topical applications; fourth, there is obtained in addition the beneficial action of the physiologic properties of the current.

The technique of the treatment is similar to that of any galvanocaustic application, save that necessarily, the positive pole is always the active one, and for the usual electrodes there are substituted bulbs and needles of copper, zinc or iron. These are the metals that seem to have the widest range of usefulness as therapeutic agents.

**Cataphoresis**, or electrical osmosis, means the introduction of medicaments by means of electricity into the body through

the skin, or Mucous Membrane. It is purely a physical process, and has nothing to do with electrolysis, either interstitial or metallic, the principal use of which is to produce local anaesthesia for Neuralgia, superficial pains, and cutaneous operations.

A solution of Cocaine is probably the most common application, by this method, for the relief of pain and superficial operations, although a mixture of Aconite and Chloroform, or Belladonna, or any drug as may be indicated.

The positive pole would be the active one in the cataphoric method, a very small absorbent cotton or sponge electrode being used, and the negative on the opposite side of the part, using No. 2 or 3 resistance. The strength of the current may be used to the point of easy toleration. The less current used, the more time will be necessary to produce results.

When using a saturated solution of Iodide Potassium, as in the treatment of Goitre, and joint affections, the negative should be the active pole.

## ELECTRICITY IN GYNAECOLOGY

The electrical treatment of diseases of women has one element in it, which prevents it from ever being looked upon with favor by the brilliant surgeon, who can make or mar a woman's fate in the brief space of an hour. While just as much diagnostic skill is required as in surgery, electrical treatment unfortunately requires an enormous amount of time, comparatively speaking.

The surgeon who is unacquainted with the therapeutic action and value of the constant current, has an antipathy for any other method, except the knife, in the removal of any form of growth. He is also indifferent to the post-operative consequences, which so often make invalids for life, because of surgical adhesions and intestinal distortions, which might have been avoided.

The diseases and functional disturbances which are amenable to successful treatment by electricity are Amenorrhoea, Dysmenorrhoea, Menorrhagia, Cellulitis, Non-purulent Salpingitis, Endometritis, Metritis, Subinvolution, Superinvolution, Uterine Fibroids, Deficient development, Stenosis of the Cervix and Uterine misplacement.

In giving instructions for the use of electricity on any part of the body, it has to be assumed that the diagnosis is sufficiently clear, and that the operator is equally as cautious that he may not invade pathological areas where the current would be useless

or do positive harm. No where should the above statement be so strictly followed as about the delicate structure of the Uterine Appendages.

The following suggestions outline procedures which apply to the majority of cases, the prescribed dosage required under the pathological conditions, which is of great importance in becoming familiar with the method, should always be kept in mind.

Fibroids of the sub-mural or sub-peritoneal variety, those large enough to cause obstruction of any consequence, or a rapidly growing one in a patient under thirty-eight, are strictly surgical.

With an average case of Interstitial Fibroid, whether hemorrhagic or otherwise, the proper technique being pursued, the patient can be made symptomatically well, with a tumor diminished more or less, according to the faithfulness with which she continues her treatment, until pronounced unnecessary.

The growth will disappear no more than will the Uterus, as it is a part of it, but a diminution in size, to the extent of relieving pressure, and putting a patient who constantly complains of discomfort, into a condition of comparative ease, will result. What more could a reasonable person expect when the possible dangers of surgery are confronted?

Fig. 1

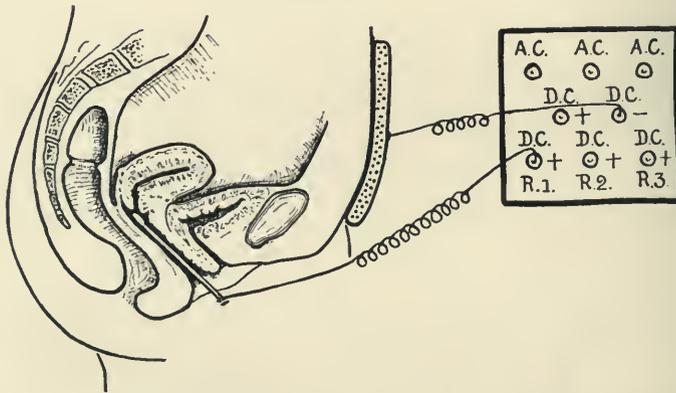


Fig. 1,— represents Carbon Ball Electrode application for the treatment of Uterine Prolapsus and similar conditions. A current strength of 15 m. a. with large surface Electrode for 10 minutes usually is sufficient.

Many of the Fibroid cases, as in simple misplacements,

have more or less backache. Placing a smaller electrode (4'' x5'' or 5''x6'') on the back, leaving the vaginal electrode in place, and applying the alternating current, using the same No. 1 Cam, which procedure takes but little time or trouble, will allow the patient to leave the office with a feeling of relief from her dragging, painful sensation, and in place have one of more or less exhilaration.

In the hemorrhagic form of Uterine Fibroids, the above technique may be carried out omitting the stimulating part of the alternating current on the back, and the use of the intra-uterine copper or zinc electrode, which will be described under "Metallic Electrolysis".

The application to the endometrium with a soluble (zinc or copper) electrode requires considerable dexterity in manipulation.

In ordinary uncomplicated Uterine prolapse, Retroversion, Anteversion, Relaxation of Vaginal Walls, the same technique as applied to non-hemorrhagic Fibroids is used with the vaginal electrode (positive) followed with alternating current on the back. If, for any reason however, in the last condition mentioned, the direct current is not to be used, then the regular size vaginal electrode is to be adopted, using Cams No. 1, 2 or 3, according to the amount of stimulation desired for the individual case in hand Fig. 1.

Another form of technique in using the Generator on either A. C. or D. C., is obtained by placing two surface electrodes, one on the Lumbar, the other (larger one) just above Pubes, using a bifurcated cord and the single cord attached to the internal electrode. This procedure allows more current to be used and is considered advisable. See Fig. 2.

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In Uterine flexions, the above considerations do not apply until the flexion is relieved, as there is a pathological condition at the angulation, which can be best cared for by using negative galvanism at the flexion with not over 10 m. a. for ten minutes, for the local nutritional effect, followed by alternating current, if conditions seem to indicate.

Fig. 2

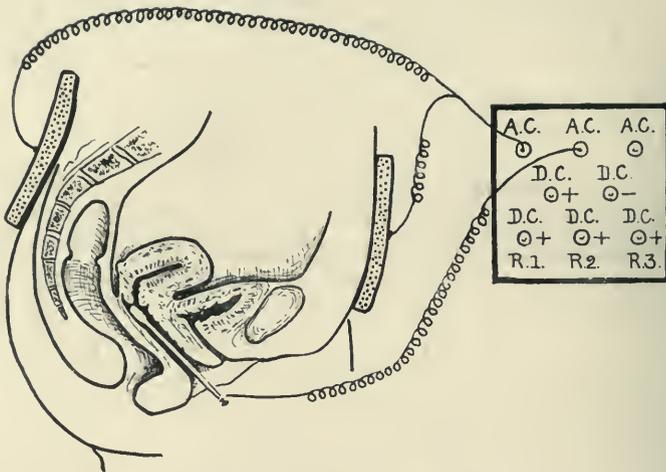


Fig. 2,— shows continuation of the same treatment as described with Fig. 1, with the internal electrode remaining in place and a surface electrode on the back with the A. C., using Cam No. 1, the strength to be the point of easy toleration.

Fig. 3

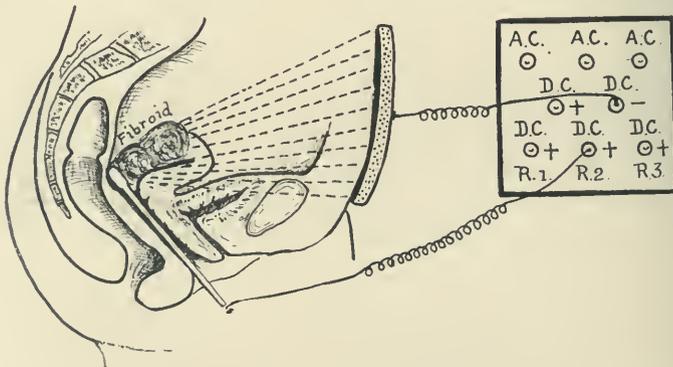


Fig. 3 represents a medium size of interstitial Uterine Fibroid situated posteriorly and easy of access. Use the carbon ball electrode covered with absorbent cotton moistened with some antiseptic solution or, better, have antiseptic gauze moistened to complete saturation for good conduction. Do not use vaseline or other demulcents of an oily nature as it will interfere with conductivity. Non-irritating surgical soap is better. Place

the electrode described, firmly against the best presenting surface of the Tumor. In the above case the Fibroid is in posterior Cul-de-Sac. With the abdominal electrode thoroughly saturated press every inch of its surface against the skin. Use D. C. R. 1 or 2, and possibly D. C. without resistance. Turn the current on gradually until the desired milli-amperage 20 to 30 M. A. point is reached. It is best in susceptible hyper-sensitive patients to start with about two-thirds of the intended dose, and in less than two minutes, as the skin has become better moistened, with less resistance, the full amount may be added.

If the Fibroid is situated anteriorly or laterally, the point of contact should be adjusted accordingly so that the current, as indicated by the dotted lines, may penetrate upon it from the abdominal electrode, which should be the largest size. If it is not a hemorrhagic case, the internal electrode may remain in place and an alternating current used through the back as shown in Fig. 2, using Cam No. 1, for its local tonic sedative effect, rather than any special action on the tumor itself. The abdominal electrode, during the use of the alternating current, would, of course, have been removed. If a longer period than twenty minutes is permitted for a galvanic current to pass through the tumor it is quite possible that the patient may complain of a deep-seated pain, which would be due to the contractile inter-polar action. A word of caution here is necessary: if the patient complains of a deep pain or feeling of soreness after the current is turned on, ascertain at once if there is a pus tube, or adhesions about the Caecum or elsewhere, from which harm might come, if the treatment is persisted in. Possibly discomfort might be caused by the vaginal electrode pressing a little too firmly; release it slightly to remove the difficulty.

Fig. 4

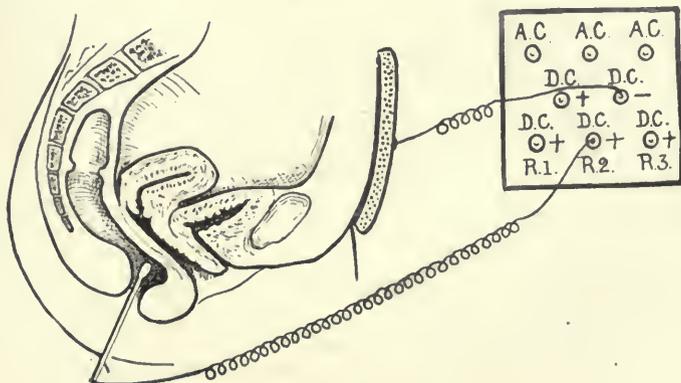


Fig. 4,— represents a Copper Electrode inserted in the rectum for treatment of Hemorrhoids, for which a current strength of about 8 M. A. for ten minutes will usually be sufficient. The abdominal Electrode should be of the largest size, the current should be turned on and off slowly, and the electrode removed with care as instructed under Metallic Electrolysis.

In making local applications of the A. C. and the D. C., to prolapsus in any form, always bear in mind the great possibility of an existing impacted Sigmoid, the weight of which may seriously interfere with the success of gynaecological treatment, no matter how well it is performed.

Profuse and irregular menstruation can usually be intelligently cared for by positive vaginal treatments, using Cam 1, R. 3, not over 15 M. A. for fifteen minutes.

In Dysmenorrhoea the success of the treatment will depend upon the accuracy of the diagnosis, whether from either ovarian or uterine misplacement, or Stenosis of the Cervix. Stenosis of the Cervix, especially in young and unmarried women, is the most common cause. In this case the proper procedure is to dilate the cervix by electrolysis, using graduated electrodes made for the purpose, and the negative pole of the constant current. A current of six to eight M. A., is easily borne and is sufficient to cause the necessary softening and relaxation. A stronger current might take less time, but the possibility of cauterization would be greater and ought to be avoided, to prevent cicatricial tissue following. By carefully following well-known rules and regulations in the use of the galvanic current, permanent dilation of the cervix can be accomplished. The results are in marked contrast to those obtained by the usual method of forcible dilation under anaesthetics, which results are only temporary.

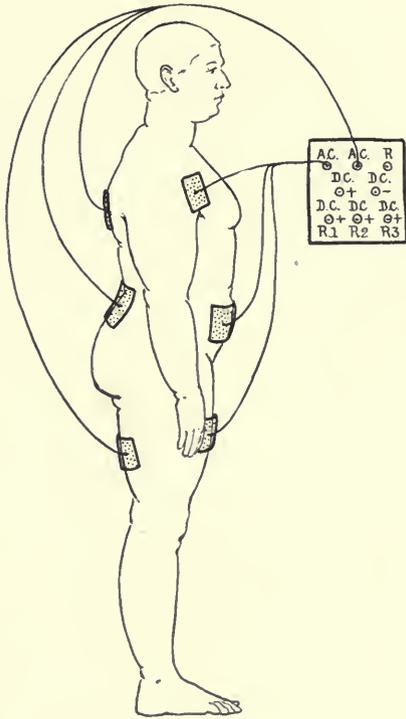
Endometritis with vegetations and granulations is characterized by pain and hemorrhage. The usual treatment is to dilate the cervix and use the curette to remove the vegetations and granulations. These indications are overcome in a very complete and satisfactory manner by negative intra-uterine applications of galvanism. The electrolytic action is used to destroy the granulations and vegetations, and the antiseptic and tonic effect of the pole aids in accomplishing healthy reproduction.

## CONSTIPATION

Probably no word in medical literature has been more wrongly interpreted in its pathology, than the term "Consti-

pation." The careless and indifferent use of cathartics, the latitude with which physicians allow their patients the indiscriminate use of drugs and the lack of directions relating to diet, drinking water, posture, etc., are responsible for the usual existing conditions in Constipation. All that is later given upon the treatment of Intestinal Stasis applies more than to anything else, to its symptom, Constipation.

Fig. 5.



**OBESITY**

Obesity, the bugbear of physicians, is a problem requiring much patience and many treatments to bring about desired results. The fact is that the average obese subject persists in living wrongly as regards diet and exercise, but much can be done to relieve the patient by the combination of proper diet and vigorous muscular gymnastics.

The Generator used with several (4x5) small electrodes properly placed over the fatty areas using Cam 6 or 7 with the

alternating current and frequent treatments, may accomplish much. In this treatment use two or more bifurcated or trifurcated cords. Fig. 5., with electrodes placed where muscular gymnastics can be produced to the best advantage.

Reducing a fleshy person by dieting without exercise, is likely to leave the person old and flabby in appearance. If treated by physical measures alone, ignoring diet, the old condition will return, when the treatments are stopped, but an intelligent combination of diet and rapid wave current treatments, is usually productive of satisfactory results.

In the treatment of Gout, Rheumatism, the diseases of the Spinal Cord, (Chronic Myelitis, Locomotor Ataxia, etc.,) and the various Neuroses, the instructions already given for the use of the constant current apply.

## BRONCHITIS

Sub-acute and chronic Bronchitis is treated by using Cam No. 2, A. C., the 4"x6" electrode on the back and the 4"x5" under the Clavicle, treating each side separately, or using a bifurcated cord and two small electrodes in front. The latter procedure saves time.

## EYE, EAR, NOSE, THROAT

The Eye, Ear, Nose, Throat, and delicate areas require special shaped electrodes, but very often one can improvise with material at hand to meet special cases.

## RHEUMATISM

The conditions known as Neuritis, Neuralgia, and Muscular Rheumatism, are quickly relieved by the use of the galvanic current.

For relief of pain and inflammation, the positive pole should be over or above and the negative pole below the parts to be treated, in acute conditions and inversely chronic conditions the negative would be the active pole.

Considerable strength of current can be borne through Arthritic joints, giving quick relief to swelling and pain, which of course is only symptomatic treatment, as the usual causes, Intestinal Stasis, Infected Teeth or Tonsils, and specific conditions may have to be considered.

## PROSTATIC ENLARGEMENT

The success attending the treatment of chronic Prostatic Hypertrophy with the Static machine and High Frequency apparatus has caused much controversy among surgeons who consider only one method; namely, operation.

Prostatic surgery shows such a large proportion of fatalities and often such deplorable conditions afterward, that that procedure is to be avoided, except when actual obstruction, Cystitis or Malignancy, is threatened.

If a troublesome Prostate, causing frequent urination, can be relieved, so that the patient is symptomatically cured, even though enlargement still exists, much has been accomplished. Such relief the author has given to several hundred patients.

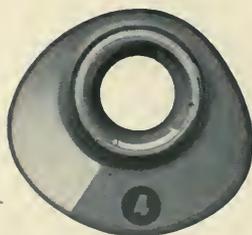
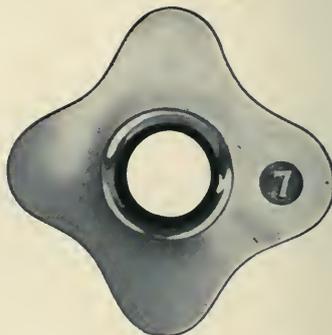
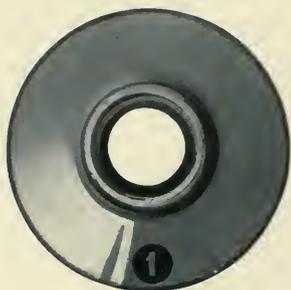
In treating Prostatic Enlargement, with the patient on the side, place on the abdomen the large (6"x8") electrode and a Prostatic electrode against the Prostate, with some device for holding it in place. Use a No. 6 or 7 Cam, A. C. from ten to fifteen minutes with a current of sufficient strength to be felt in the Rectum. Applications should be made not oftener than three time weekly, at first. Gradually extend the time between the treatments.

## FLAT FOOT

Many conditions of distorted ankles and feet are called Flat Foot, without considering the pathology. The average case, with the foot rotating inwards, should be treated as follows:— Place a small electrode on the inner side of the arch and another on the upper origin of the Tibialis Anticus muscle at the knee, using Cam No. 1, negative galvanic, on the inside of the foot, then Cam No. 5, A. C. for a few minutes; repeat often enough to regain the tone of the weakened muscle.

## SELECTED MOTION CAMS

The use of which will be more fully described under the subject of treatment



## CAMS

When the Generator is put into operation, the rapidly revolving armature and magnetic field are made to approach and recede in automatic manner. The length and character of the waves, and the consequent muscular contractions are regulated by the shape of the special cam selected for the work to be accomplished.

### CAM NO. 1

This Cam produces a cellular massage, without surge, by virtue of its rapid vibratory impulse. This current is particularly useful in muscular weakness, especially of the extremities, and for improving local metabolism and restoring tone to the parts.

### CAM NO. 2.

Cam No. 2 produces a current of twenty-two surges per minute, with equal periods of contraction and rest. This current is particularly indicated in infantile paralysis (chronic stage) and paralysis of the extremities. Its use causes contractions of atrophied muscles, at a rate that harmonizes with that normal muscular activity.

### CAM NO. 3

Cam No. 3 is especially useful for parts, requiring a delicate massage with deep penetration. This cam is so constructed that the rise to the maximum potential, or peak of the surge, is extremely gradual, producing a gentle contraction, indicated for exercise of muscles, whose natural function is associated with the organs of digestion.

### CAM NO. 4

This cam produces a heavy contraction, which is prolonged at the peak of the surge with abrupt diminution of intensity of short duration, followed by an equally abrupt rise. Cam No. 4 is the most useful of all, as it is particularly indicated in the treatment of INTESTINAL STASIS, STOMACH DILATATION, and constipation, with its subsequent complications. Like Cam No. 3 it has eleven surging wave impulses per minute.

Cam No. 4 is constructed to synchronize with the normal peristaltic action of the gastro-intestinal tract and aid nature in the restoration of muscular tone and to exercise the muscles controlling these organs.

### CAM NO. 5.

Cam No. 5 produces a surge, the frequency of which is especially valuable in the treatment of facial paralysis, joint affections, and adhesions where rapid manipulation would be indicated. For nose, ear and throat work in which a delicate and easy tolerated massage is very often desired, this cam is most valuable. This cam produces sixty-six surges per minute.

### CAMS NO. 6, 7 AND 8

Cams number 6, 7 and 8, give thirty-three, forty-four and fifty-five muscular impulses respectively, per minute, the indications for the use of which must be necessarily-variable, according to the pathology of the case at hand.

By using a surface electrode of at least 6"x8" with properly shaped and insulated prostatic electrode, Cams No. 6 and 7 can be made to imitate manual prostatic massage, in a very satisfactory manner.

In affection of the knee and ankle, and in the treatment of flat foot, cam No. 8, when used vigorously, gives a good imitation of normal muscular and ligamentous action in those sections.

In many of the cases named, especially in which cams 2, 3 and 4 are used, and in which normal muscle movement is to be imitated, the use of either the 6, 7 or 8 cam, for two or three minutes preceding the use of others, will cause a sudden invigoration of the circulation of the part, which renders the condition more susceptible to benefit when the regular cam for the case is used.

After the physician has become acquainted with the physiological action of the different cams, he will be able to select what is needed for a given case, without the aid of books.

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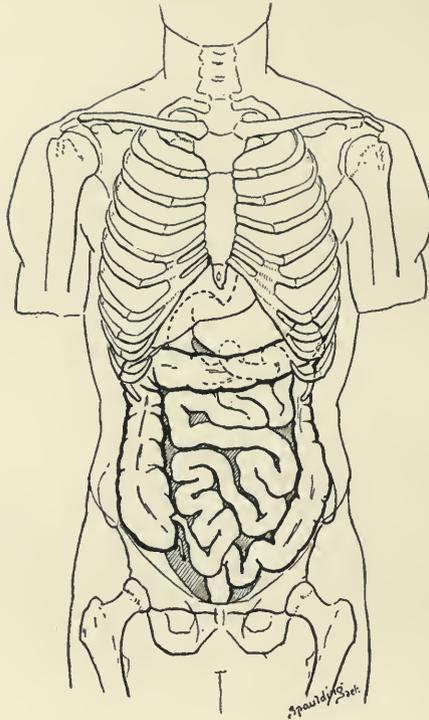
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The following cuts, and their descriptions and indications for treatment with the Morse Wave Generator, should be a sufficient guide to the average physician who is at all familiar with the interpretation of X-Ray work along the digestive tract. Practically all cases of colonic distortion, when the transverse colon is sagging to any considerable extent, must necessarily be caused by ptosis of the stomach. If the stomach is affected and there is no evidence that the digestive tract below fails to functionate properly, the same instructions as regards the application of the Generator can be carried out except that the smaller electrode in front should be placed transversely under the stomach and the back electrode a little higher on the back. As will be described No. 3 Cam causes eleven muscular contractions per minute, corresponding as near as can be produced to normal peristalsis. The current increases very gradually smoothly until the maximum point is reached and then recedes with the same smooth muscle impulse. No. 4 Cam gives the same number of contractions per minute but by being different in shape the impulse is produced more abruptly and prolonged at the peak of the wave and suddenly subsides. It is advisable, therefore, to use No. 3 Cam in timid, over-susceptible subjects or when treating patients for the first time, and No. 4 Cam when more powerful muscular contractions are to be desired. There are many points in the technique of electrical applications that the physician must necessarily learn for himself. The author feels that words of caution and suggestion that follow should be of real help to the physician who reads carefully and intelligently.

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Fig. 6.



This figure represents the natural position of the stomach colon and small intestines. It is obvious that the rounding character of the corners of the entire Intestinal tract is so designed that during normal Peristalsis there is little or no obstruction or friction to the passage of bowel contents. With normal conditions of intestinal tract there will be no area for retention of toxins, whereby through either direct, local or reflex action, the health of the individual might be impaired.

Any perversion from the normal plan of elimination, as angulation, kink, fold or twist, that in any manner retards proper elimination of waste product, may be the seat of future Ulcer, Cancer, or Adhesions, and surgery, which usually comes too late in these regions, may have to be resorted to.

In the light of our present medical knowledge it is always advisable and, in many cases most essential, to have a careful fluoroscopic and radiographic diagnosis made before resorting to any active measures, either surgical, mechanical or electrical. However, one with fair diagnostic ability should be able, in the

absence of the X-Ray, to be reasonably sure whether the case is one for surgery or not, and act accordingly.

When any external muscle of the body, through injury or disease, becomes impaired in its local function, exercise, the passive movements, massage, electricity, etc., are the rational methods for restoring function. The same should apply to distorted portions anywhere along the digestive tracts and the following cuts illustrate, from the author's own radiographic work, conditions that are met with in the daily work of every practitioner of medicine. If the patient is not too old, or tubercular, or has no specific disease whereby cure is not expected, restoration to normal functioning is possible, in most cases, the degree depending upon the willingness and ability of the patient to follow instructions upon treatment and diet.

Figures 7 to 13 inclusive, represent a fair average of the cases of colonic stasis from radiographs taken in the author's office which were carefully diagnosed by fluoroscopic examination to make sure of the absence of immovable kinks, obstructions or adhesions, that might probably indicate the necessity of surgery.

Fig. 7.

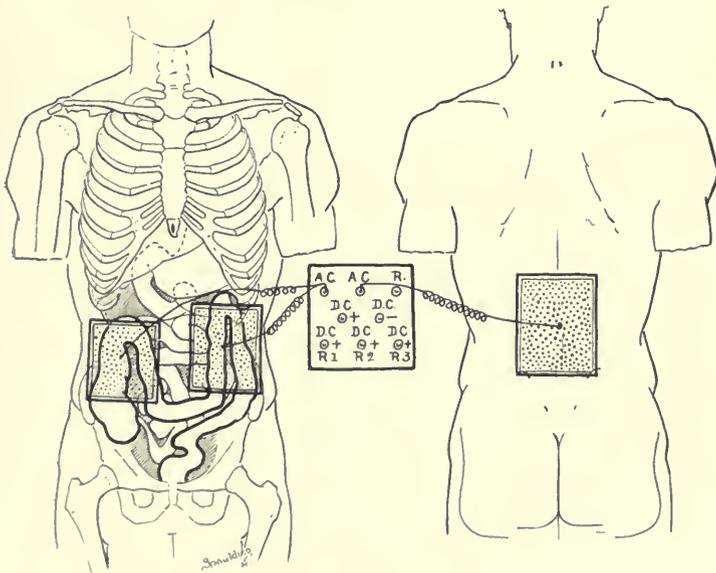
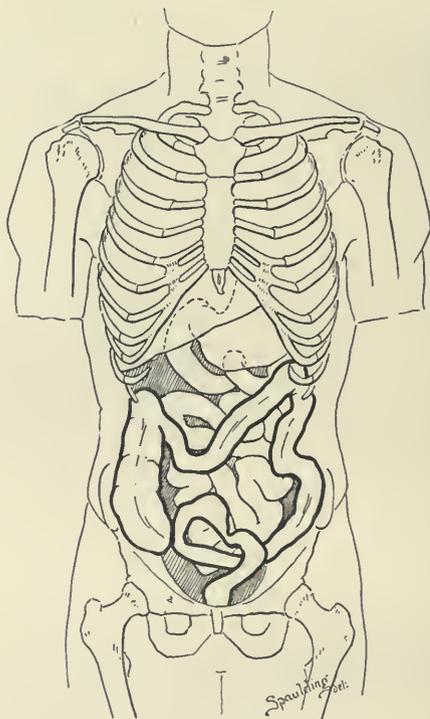


Figure 7 shows a marked case of Colon prolapsus impinging on the Sigmoid, accompanied by a very much prolapsed Stomach, producing severe inertia, obstinate Constipation, nervous dis-

turbance and infection, especially in the joints (Arthritis). With twenty-four treatments, covering a period of two months, laxatives, with the exception of mineral oil once daily, were discarded, and the many painful nervous symptoms apparently cured.

Fig. 8

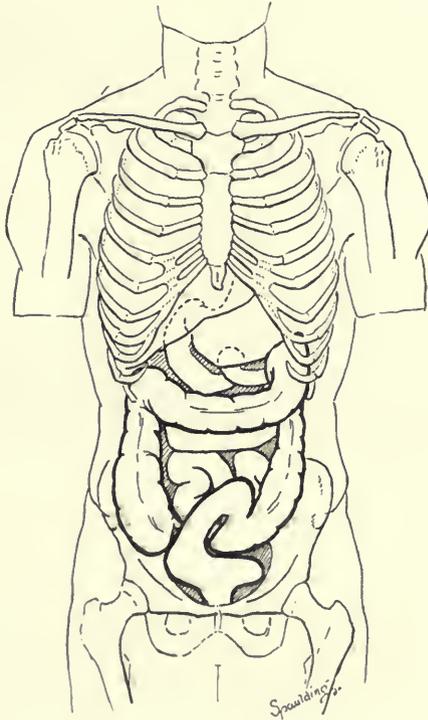


This figure represents a slight angulation of colon at the Hepatic Flexure, a very marked one at the Splenic Flexure, and a well-defined impaction at the Sigmoid. Constipation which was the patient's principal symptom, was caused largely by the Sigmoid distention producing local inertia. The indications for treatment are simple in this class of cases as the pathology seems to be so clearly outlined. Use an anterior electrode over the Hepatic Flexure, No. 3 Cam, A. C., and a larger one over the sixth to twelfth dorsal vertebrae as outlined. Place same sized electrode over Splenic Flexure, using Cam No. 4, to produce longer and more pronounced contractions.

This, as well as the following cases of Intestinal Stasis to be described, will be best treated by using a 4"x5" electrode on

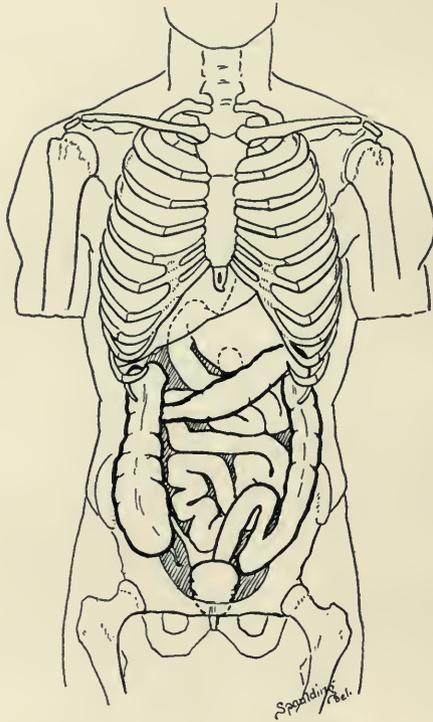
the abdomen and a 6"x8" Electrode on the back. With the sigmoid electrode, the alternating current alone must be used. For the average case of Intestinal Stasis or Gastropnoxis, ten minute treatment on each side with the alternating current is about the proper dosage. Very thin or very obese subjects may require more or less current; the judgment of the operator must determine the amount.

Fig. 9



This figure shows a distended Caecum, and a sharp angulation at the Splenic Flexure with some Hepatic Flexure distortion. The treatment outlined in Figure 7, in short time, relieved the Constipation and long-standing backache, due to infectious Neuritis from the toxaemia.

Fig. 10



This patient did not have chronic Constipation as the radiograph indicates, because the fluoroscope showed active peristalsis, though there were recurrent attacks of Constipation. However, this case urgently called for treatment of some kind to prevent the three pronounced curves from becoming dangerous kinks. In this case good results were quickly obtained, because of the considerable amount of muscular tone still remaining in the threatened pathological area. It is advisable in all cases in which the Transverse Colon is very low, to place an electrode of smaller size (4"x5") on either side and the larger back electrode sufficiently high to give an oblique effect to the muscular impulse, which would be more "lifting" in character, than if used transversely.

Fig. 11

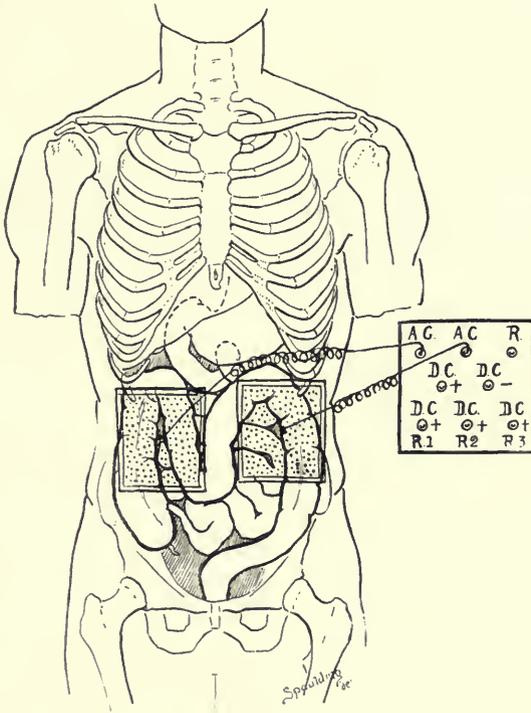


Fig. 11 Showing marked tosis of the transverse colon which would be treated most successfully as outlined by position of electrodes. Of course it is understood that in all cases of Stomach and Colonic prolapsus that a Back surface electrode is used as shown in Fig. 7. The use of one Abdominal at a time is preferable, two, with a bifurcated cord, may be sufficient in the mild form of Stasis; when so used it is advisable to select two electrodes of small size and the larger one for the back.

Fig. 12.

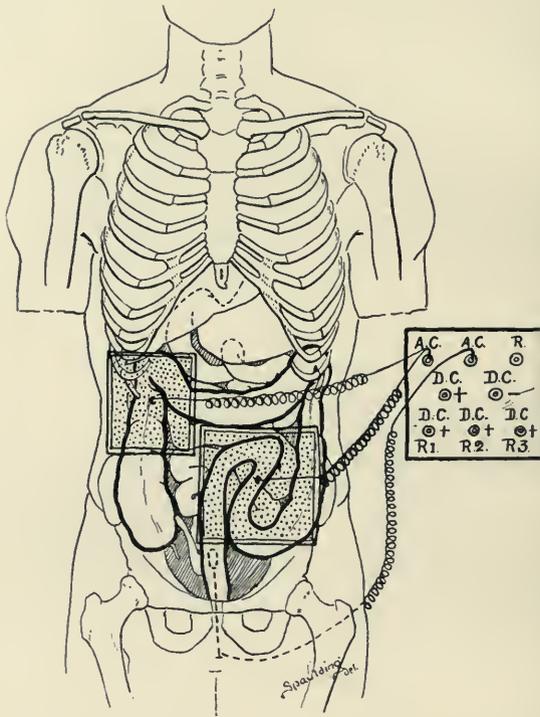
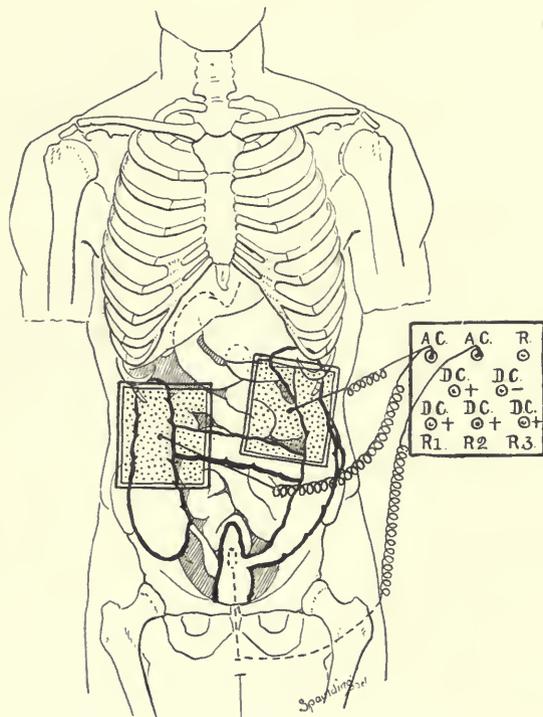


Figure 12 shows a sharp kink at the Hepatic Flexure, a much distended Caecum, prolapsus of the Transverse Colon, and Constipation. The reader will observe two surface electrodes on the Abdomen with a bi-furcated cord, also a rectal electrode connected with the A. C. This allows a more powerful surging effect, than if only one surface electrode were used. For patient with thin Abdominal walls and feeble expulsive action, the above is a good form of application. One of the surface electrodes, however, could be placed on the back and the other over the Hepatic Flexure if desired.

Fig. 13



This figure shows a marked prolapsus of the Transverse Colon due to sharp angles at both the Hepatic and Splenic Flexures. The application should be made through the Flexures from the back, using either A. C. or D. C., current on the second resistance, according to the weakness of the abdominal muscles.

Many physicians in the treatment of Intestinal Stasis are using water or some medicated solution as the internal electrode. The use of soft water greatly enhances the solvent action on the Toxins within reach.

Fig. 14

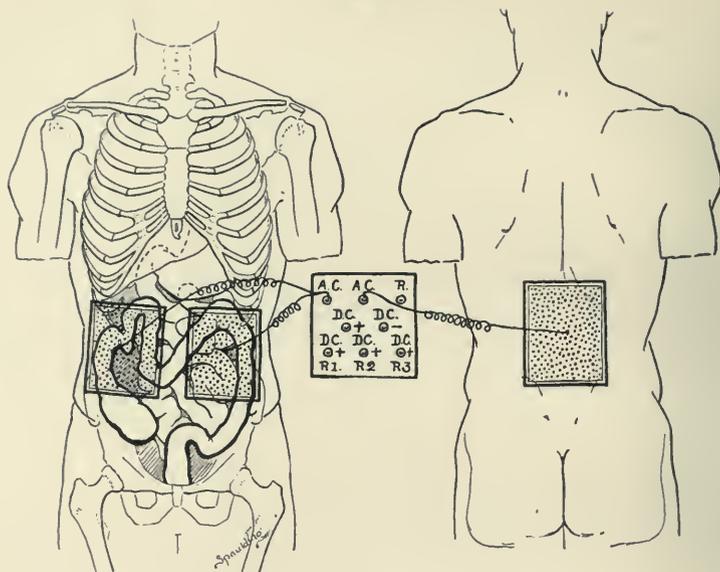


Fig. 15

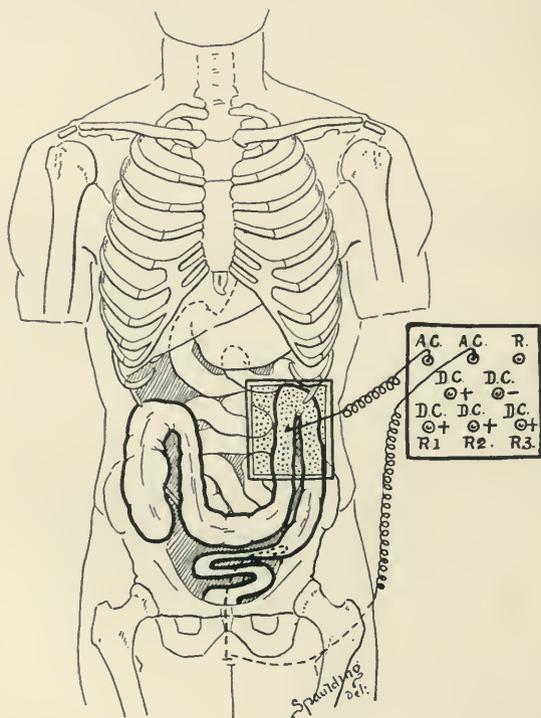


Fig. 16

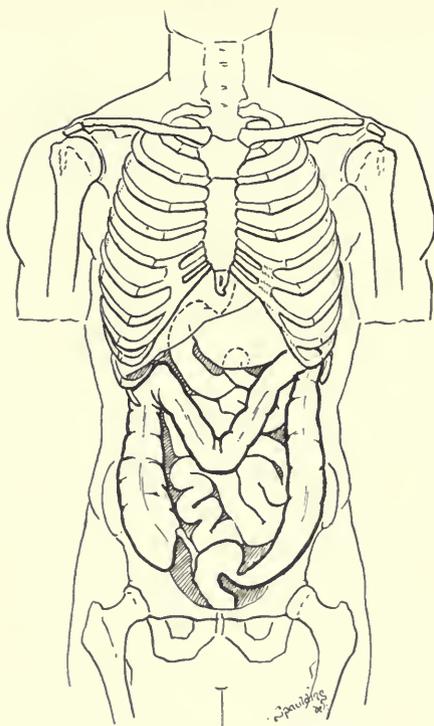
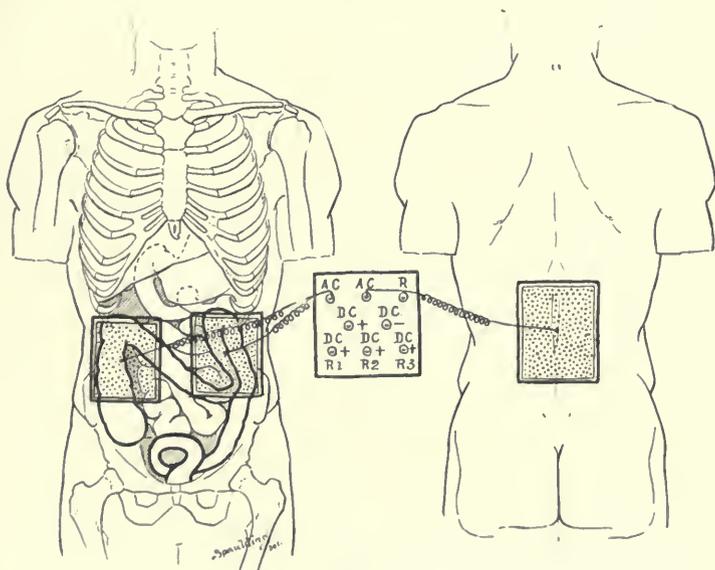


Fig. 17



Figures 14-15-16 and 17 show a reproduction of actual cases that have been under treatment for Intestinal Stasis with Constipation, and which have been very much relieved or completely cured. The same general treatment, already described, will apply to these cases. These figures are fair representations of colonic angulations which still further show the many features of this most troublesome complaint. The diagnosis for successful treatment in restoring tone, curing Constipation, etc., as has been described, will apply to these cuts.

The frequency of applications must depend upon the chronicity of the case and the age of the patient; the more chronic and stubborn the case, the more frequent the treatments should be. Chronic cases should be treated on an average of three times per week, while for less severe cases two treatments a week would be sufficient. Gradually lessen the seances as the results become evident. It is well to remember that in a well-marked case of Intestinal Toxaemia, if the poison be liberated too rapidly, absorption will be likely to ensue, and a temporary reaction in the form of Infectious Headache, or possibly some joint disturbance, may occur. Here again good judgment must play its part.

Fig. 18

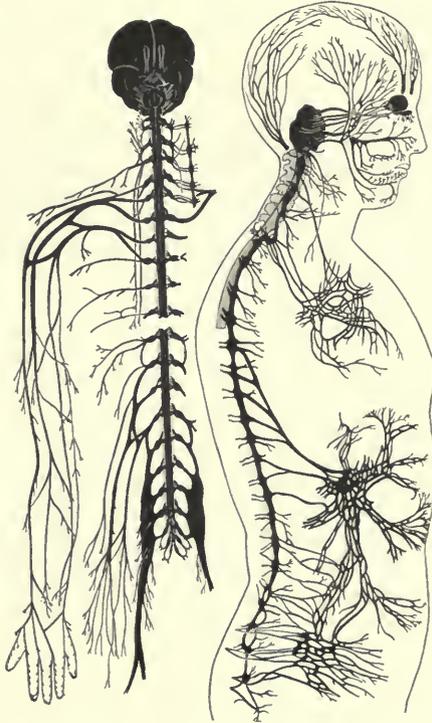


Fig. 18 represents the Spinal Nervous System, knowledge of which is so essential in making a diagnosis and outlining the technique of application, as well as in explaining to patients the cause of their painful and nervous symptoms.

Fig. 19



Patient: Woman 55 years of age.

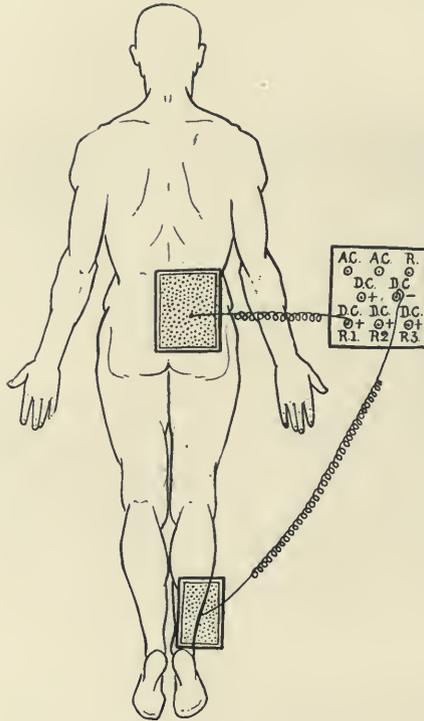
This radiogram, taken Nov. 14, 1920, shows marked pro-lapsus of all parts of the Colon, insufficiency of the Ilio-Caecal Valve, well-defined Diverticulitis of the Descending Colon, and Sigmoid Impaction.

Fig. 19A



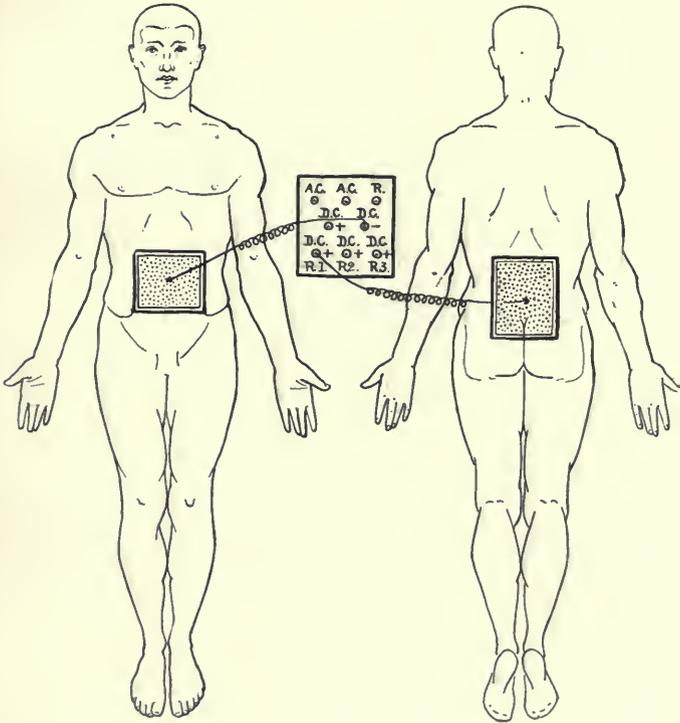
Radiogram of the same patient as Fig. 19, taken Dec. 11, 1920, after sixteen treatments from the Morse Wave Generator using cams No. 3 and 4. The result is obvious, showing increased Peristalsis, rounding out of the curves, and relief of existing Constipation. General condition of the patient is much improved. Patient returned later for treatment of the Sigmoid Impaction, using the Morse Sigmoid Electrode and Generator, with the alternating current.

Fig. 20



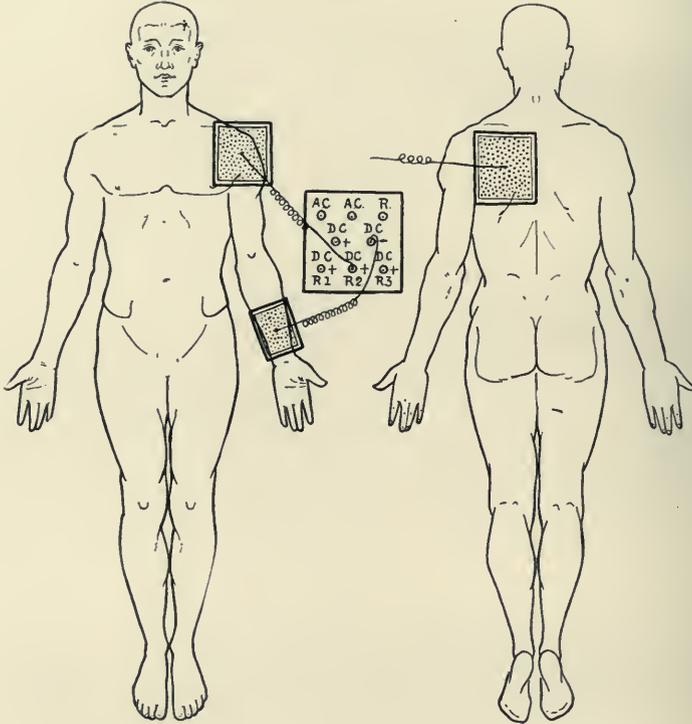
Sciatic Neuritis is a condition which, if the history of injury to nerve is not known to be otherwise, is usually caused by Intestinal Stasis, either in the Caecum or Sigmoid. While the cause should be treated as outlined for those conditions, the treatment of the immediate pain from the back to the ankle is most effective when the direct current is used, as outlined in figure 20, using ten to fifteen M. A., for ten minutes.

Fig. 21



Lumbago (Lumbar Neuritis) is most quickly relieved by using the direct current, with a large electrode over the painful area, from the positive side of the Generator, No. 1 Cam and the first resistance. A larger electrode should be placed on the Abdomen, using about ten M. A. for ten minutes.

Fig. 22



Brachial Neuritis is best treated by the direct current. In the acute stage, place the electrode on the back and on the anterior shoulder, using second resistance, with negative back and positive front. In sub-acute, or chronic cases, use the positive back and the negative front, six to eight M. A. and cam No. 2: for ten minutes. If pain extends down the arm the seance may be divided between shoulder and forearm.

Fig. 23

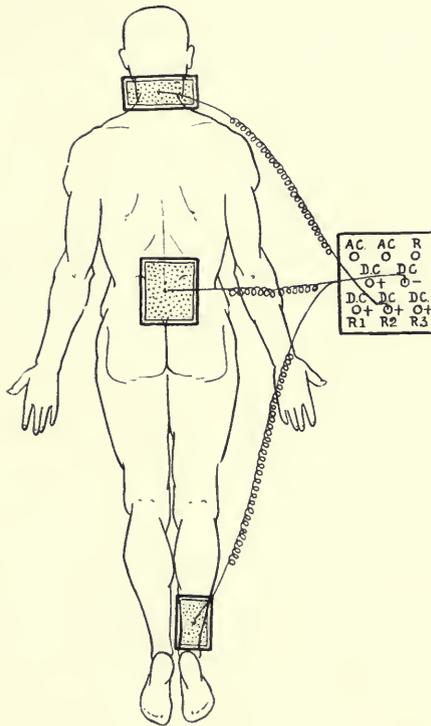
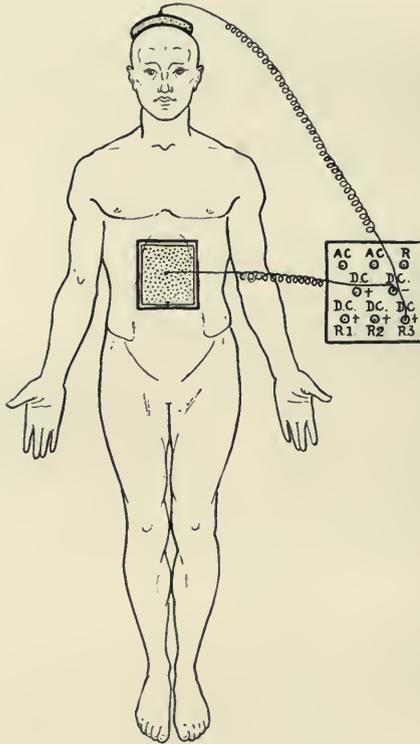


Fig. 23 and 24

Cerebral Congestion, which so often accompanies sleeplessness, hysteria, high blood pressure, or reflex, may come from the liver, Intestinal disturbances, and other causes. Use the neck electrode at the Occiput, from positive pole, resistance second or third, and not over three M. A., and the other electrode may be placed over the Solar Plexus, Back or Ankle, the first is usually chosen.

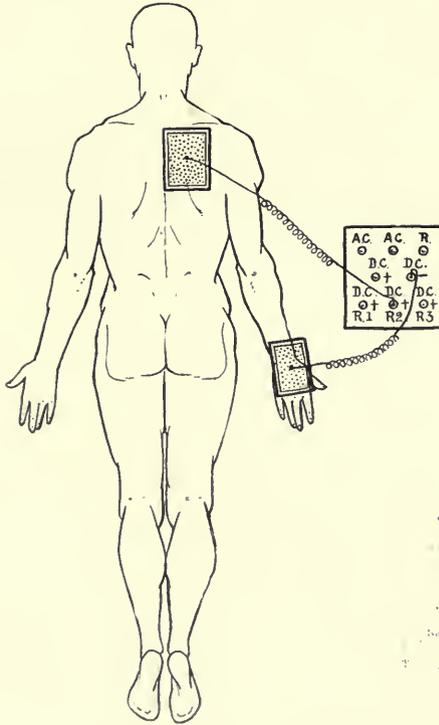
The above treatment will apply to the majority of cases of headaches.

Fig. 24



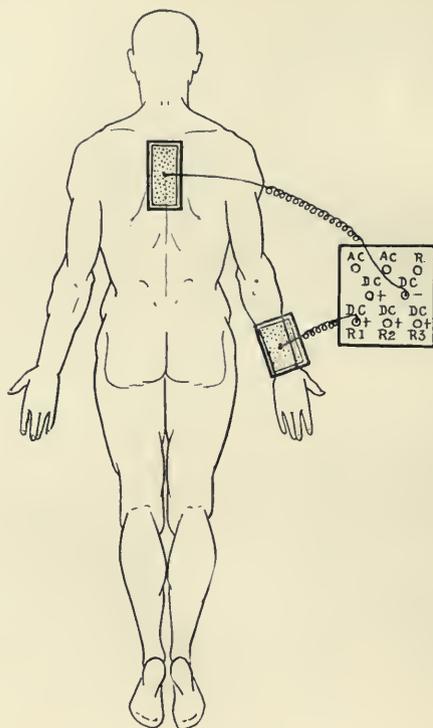
If the whole head needs treatment, as is advised in Migraine or Super-Orbital pain, moisten the scalp thoroughly and interpose a flat sponge, absorbent cotton, chamois, or some other flexible material that would act as a good conductor and conform to the head better than the flat electrode. Use two or three M. A. from positive pole for five to ten minutes.

Fig. 25



Neuritis of the entire arm should be treated in the same manner as Sciatic Neuritis, but with less current used, because the resistance in the arm is less than in the leg. Use from the positive pole over the nerve supply in the back, and the negative at the wrist, with about eight M. A. for ten minutes.

Fig. 26



In Paralysis of all forms the treatment to be used depends upon the degree to which the nerve injury has advanced. The current should always pass through the affected muscle, or muscles, lengthwise, not transversely. A safe rule to follow is,—place one electrode over the spinal nerve supply controlling the muscles under consideration, and the other beyond, or to the extremity of the disability.

For instance, for paralysis of the arm, whatever the cause, place an electrode on the back, as in Figure 26 over the sixth to eighth dorsal vertabrae, with the other in the palm of the hand, or on the wrist, using the positive pole at the spinal nerve exit in the acute and painful cases.

In chronic cases apply the negative pole to the Spine. Follow the same procedure in treating Paralysis of the leg. The amount of current should be from five to fifteen M. A., if the direct current is used and if the alternating current, turn to the

point of easy toleration. It is undesirable to have a paralyzed muscle under direct stimulation from either current over ten minutes, as a rule, because fatigue of that part might ensue from over-stimulation.

The average paralyzed area is most benefited by using No. 1 Cam, for the first part of the treatment. When the surging effect is desired use the cam that will most nearly produce the normal action of the muscle.

Fig. 27

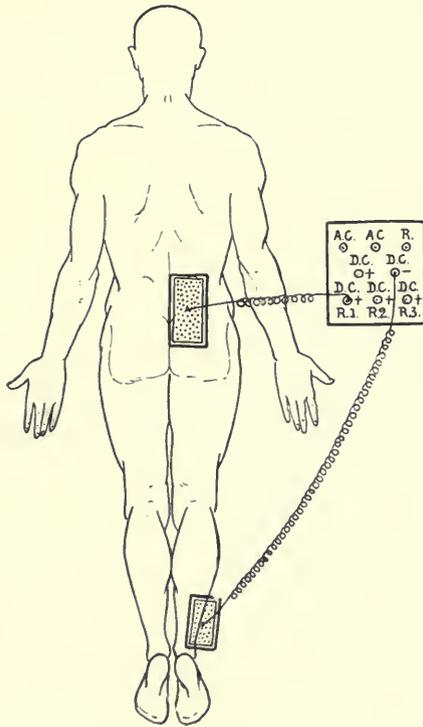


Fig. 27 and 28

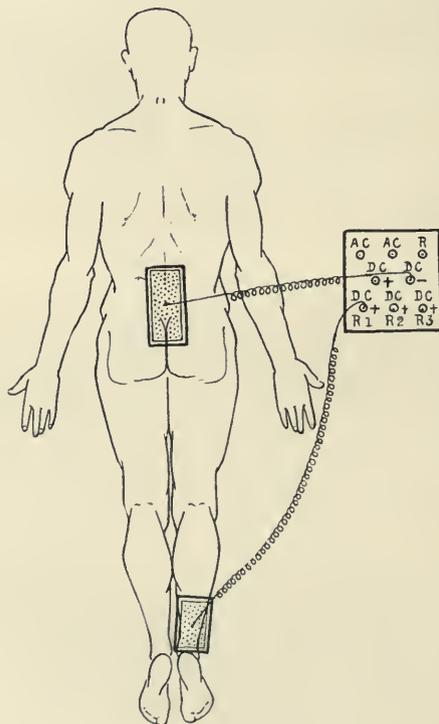
Infantile Paralysis, after the acute stage is past, is more quickly relieved, and cured, in curable cases, by electricity than by any other known method. Use the negative electrode on the Spine with the other electrode at the wrist, from five to eight minutes, eight M. A. In leg Paralysis, apply the spinal

electrode to the lumbar region and ankle, follow this with the alternating current surge, using No. 2 cam for arms, and No. 5 for legs.

Locomotor Ataxia is a disease in which degenerative changes are taking place in the posterior roots of the Spinal cord.

The object of treatment is to improve the nutrition at the immediate deep-seated affected area. The negative pole with the spinal electrode placed as described in treating Infantile Paralysis should be used, but a stronger current should be used in treating this disease than in Infantile Paralysis and other spinal affections.

Fig. 28



The following cuts show Cavity Electrodes, the use of which have been previously described.

Many and various shaped electrodes for the Eye, Ear, Nose and Throat, as well as very small ones for local nerve or muscle application, especially adapted for the Generator, are obtainable in the market, but this book is for instruction, and only those electrodes or devices are shown that are absolutely essential to explain the meaning of the text.

Inter Uterine



Carbon Ball



Oblong Copper Ball



Sigmoid



Prostatic



Vaginal



## SUGGESTIONS

1 It should be unnecessary to remind the reader that the same antiseptic precautions must be taken with all the surface electrodes as with any other applications to the surface of the body. The Morse Surface Electrodes may be rendered practically sterile by steaming or scrubbing with soap and hot water.

2. A bi-furcated cord can be used for saving time when either arms or legs apparently need the same application, by placing a large electrode on the back and two smaller ones on the wrists or ankles. The same principal applies to Vaginal and Rectal treatments.

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## RULES

1—Remember, that there are motor points (Nerve Exits) all over the human body, and that electrical susceptibility is greater over that immediate area. (See books on Electro-physiology).

2—Remember, that a sensation may be felt anywhere along the course of a nerve, no matter where the source of irritation exists. This applies to electrodes placed indiscriminately on the body.

3—Remember, that direct, constant and galvanic current are synonymous terms that you may not get confused when reading the literature on the subject.

4—Remember, that the direct current has, unlike any other, the power of heating the part through which it passes and its action is not confined wholly to the poles.

5—Remember, with the direct current that there is obtained at the positive pole a contractile, pain-relieving, haemostatic, anti-congestive action, and at the negative, a congestive, irritating, hemorrhagic effect is produced.

6—Remember, that mild currents invigorate and strong currents depress vital tissue. Therefore, in the application, if the seance is too prolonged or too strong, harm as well as benefit might ensue.

7—Remember, that during the application of either the direct or alternating current, your patients are receiving more muscular gymnastics, deeper-seated elimination, and the galvanic current in a pleasanter form than you ever saw administered before.

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## DONT'S

1—In using the Morse Wave Generator do not expect the milliamperemeter needle to move when using the alternating current. The volt meter needle may or may not move according to the resistance in circuit. Movement is of no consequence with the alternating current.

2—Do not turn the direct current on or off a patient suddenly. Do not turn the alternating current on suddenly, but there are no objections to turning it off suddenly.

3—Do not allow the Generator to run with the door open and a Cam in place, as it is the closed door that keeps the Cam secure. Should a Cam fall off while the Generator is in motion, some part of the apparatus might be broken.

4—Do not move electrodes of any kind, or shape, externally or internally, with the current in action. This applies more especially to the direct current, when a nerve exit might be touched, producing painful contractions. Moving electrodes about on the surface indicates that one is not sure of their pathology and may actually harm their patient.

5—Do not fail to have surface electrodes thoroughly saturated to the metal conductor under the rubber back. This is more essential with the direct than with the alternating current. A wet surface does not always mean deep saturation.

6—Do not put surface electrodes over bony prominences when it can be avoided, but if necessary make it conform to the part.

7—Do not fail to have absolute contact of electrodes wherever used. Not only will this insure better results but add to the patient's comfort. Sandbags, cushions at the back, bandages or towels pinned tighly over the electrodes on the extremities will improve the contact.

8—Do not allow the metal part of an electrode or metal tip to touch a patient. Should this happen the A. C. would give an unpleasant sensation, and the D. C. a possible burn, which if caused by the negative pole would be slow to heal.

9—Do not attempt to remove a copper or zinc electrode after the treatment is finished, until you are sure it is sufficiently loosened from its position.

Many other diseases and conditions might be mentioned and detail of treatment described and illustrated but why weary the reader if the general principles which govern the use of the methods used, have been plainly set forth. The frequency of applications, the length of seances, the size and shape of electrodes used must depend upon individual cases, requiring at times much tact and judgment. Therefore, if the perusal of this book has furnished its readers a more comprehensive knowledge for the treatment of diseases in which the usual forms of medication are frequently unsatisfactory, then the writer's mission is fulfilled.





## MORSE SURFACE ELECTRODE

The New Model of the Morse Moist Surface Electrode is composed of an asbestos compound for conduction, a moulded pure rubber back for protection, and a locking device on a cord tip on the electrode, so that accidental detachment is impossible. It is considered by experts to be the best moist conductor ever devised for the purpose. Made in various sizes.

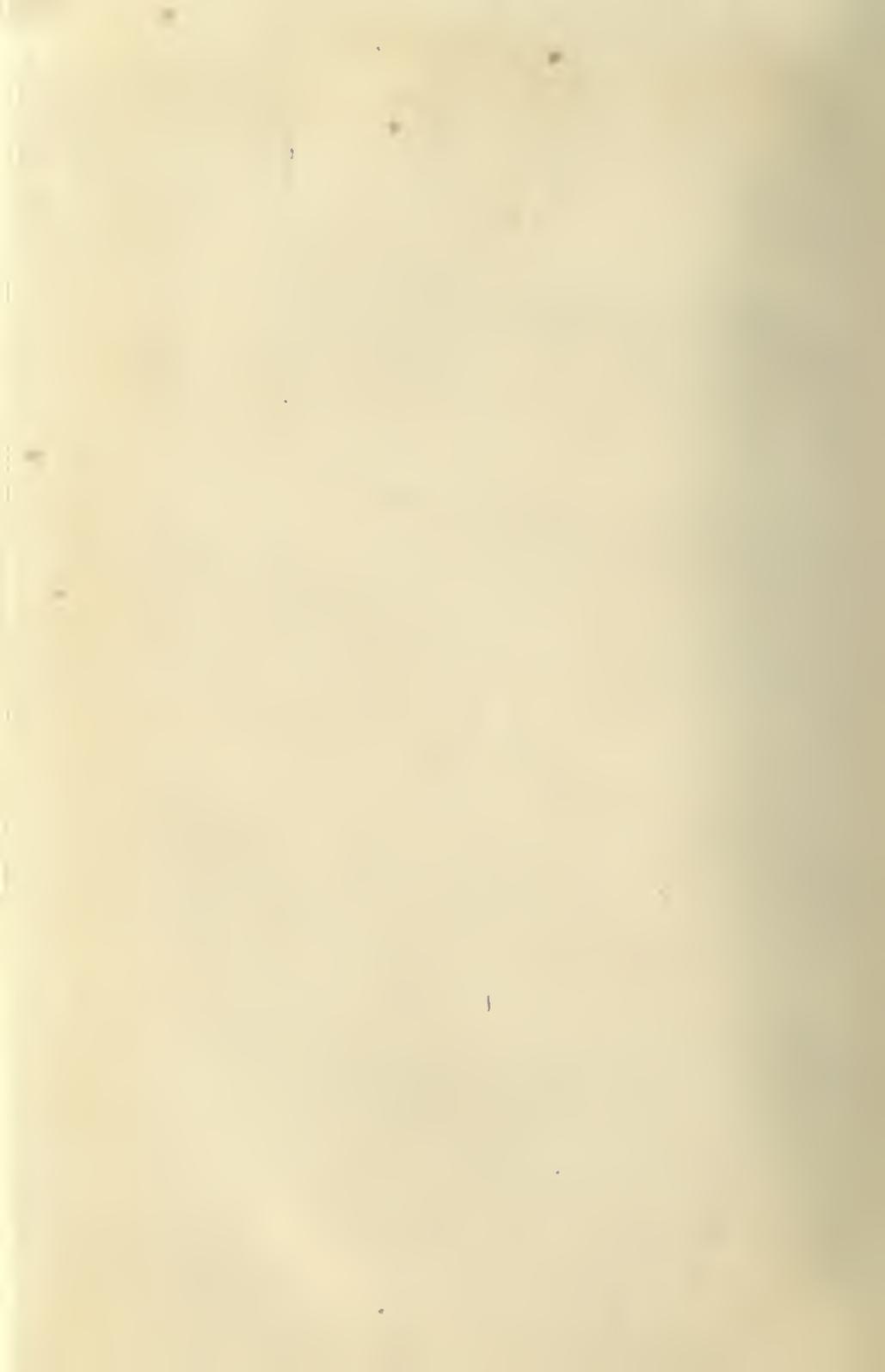














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